Hitfin Inc.
55 E 3rd Ave, San Mateo, CA 94401
(775) 238-6536
info@htifin.com

February 21, 2016

CFTC's Technology Advisory Committee (TAC)
Three Lafayette Centre, 1155 21st Street NW.,
Washington, DC 20581,
Attention: Office of the Secretary
secretary@cftc.gov

Re: Public written comment to Technology Advisory Committee Meeting February 23, 2016

Dear CFTC Technology Advisory Committee,

Hitfin, Inc. hereby submits public written comment to the Technology Advisory Committee in anticipation of its discussion on blockchain and the potential application of distributed ledger technology to the derivatives market. Hitfin, Inc. is a blockchain technology provider developing applications for financial enterprise. Blockchain technology is an essential tool for the Commission to have in place for system monitoring, cross-product, and cross-market surveillance. For the reasons outlined in this comment, Hitfin, Inc. strongly supports the use of blockchain distributed ledger technology in the derivatives market.

I. Blockchain technology advances the core principles of the CFTC

Blockchain technology has the ability to greatly reduce the operational costs of derivatives trading while simultaneously furthering the core principles of the CFTC. The mission of the Commodity Futures Trading Commission (CFTC) is to “foster open, transparent, competitive, and financially sound markets, to avoid systemic risk, and to protect the market users” so that hedgers and other market participants can use such

markets with confidence.[1] To this end, the CFTC has established a set of core principles.[2] In addition, the CFA Institute 2015 Global Market Sentiment Survey identified areas that market participants express as top concerns for the integrity of the markets.[3] Blockchain technology is well suited to advance several of these objectives. Blockchain technology is developing at a rapid pace and is no longer limited to sending virtual currency transactions.

A. Brief Overview of Blockchain Technology

Blockchain technology is characterized by a distributed database. This database consists of multiple interconnected computer nodes. Each full node consists of a copy of the database, obviating the need for a centralized or master database. There are various consensus mechanisms used by blockchain technologies to keep the nodes in sync with one another. Blockchains may either be permissioned and stored in multiple nodes owned by the same entity/group or they may be spread across nodes owned by separate entities over a network of interconnected computers. Another characteristic common to blockchains is that the data in the blockchain is resistant to tampering and revision.

Blockchains are made up of a series of blocks of data. This data may reflect evidence of transactions, terms of a contract, recorded messages, a record of asset ownership, proof of a file's existence at a particular point in time, or other data. Blockchains may enforce rules as to the type and form of data that may be appended to the blockchain. Because of the sequential addition of data to the database in blocks, blockchains protect the integrity of the data that is stored within them. Each new block of data contains a cryptographic hash of the blockchain data before it, chaining it to the previous block. Because even a small change to the source input of a cryptographic hash function changes the resulting output, changes in the database are observable by all nodes.

B. Blockchain Technology Applied to Derivatives Markets

Investment professionals overall are weary of the integrity in financial markets. Over half of CFA Institute members surveyed in 2015 point to a lack of ethical culture within financial firms as the leading cause of the current lack of trust in the financial industry.[4] Furthermore, less than 30% of members surveyed have a positive outlook on market integrity.[5] To the CFTC's credit, 2015 CFA Institute members in the United States have

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[1] *See* "Mission & Responsibilities" U.S. Commodity Futures Trading Commission. Web. 21 Feb. 2016. Available at http://www.cftc.gov/About/MissionResponsibilities/index.htm.

[2] *See* Core Principles and Other Requirements for Designated Contract Markets, Federal Register / Vol. 77, No. 118 pgs. 36612 - 36697. *See also* Core Principles and Other Requirements for Swap Execution Facilities, 76 FR 1214 (proposed Jan. 7, 2011).

[3] *See* Global Market Sentiment Survey 2015, CFA Institute, pg. 28. Web. 21 Feb. 2016. Available at https://www.cfainstitute.org/Survey/gmss_2015_report.pdf?WPID=GMSSReportText&PageName=Main.

[4] Global Market Sentiment Survey 2015, CFA Institute at pg 20

[5] Global Market Sentiment Survey 2015, CFA Institute at pg 22

shown greater confidence in regulation and oversight of global systemic risk when compared to U.S. survey respondents in 2012 and when compared to 2012 and 2015 global survey respondents.[6] Adoption of blockchain technology is likely to further increased market confidence for the reasons outlined below.

Blockchain protocols have the ability to enable secure trade and settlement of derivatives contracts and enable functionality not currently available by existing software. Software developers are creating applications that enable automated, peer to peer, secure, and auditable transactions that strictly adhere to rules written into the applications. Such transactions can be verified by, and communicated to, all market participants and the Commission. This can advance regulatory objectives and reduce costs.

Blockchains can greatly increase transparency. Block times do vary across blockchain protocols, but they are typically slowed to the point where low latency strategies do not provide a significant advantage. In Bitcoin, for example, blocks are targeted to be added every 10 minutes. In Ethereum, blocks are targeted to be added every 12 seconds.[7] This is similar to the standard 15 second SEF delay promoted by the CFTC.[8] Thus, equal access to trade information is made available. Increased transparency, in turn, will increase investor trust and provide the kind of price discovery needed among market participants. In fact, when asked what is most needed to improve investor trust and market integrity, CFA members in the U.S. cited trading rules on transparency and frequency of trades.[9]

Some rule compliance may be encoded into and automatically enforced by the blockchain. Information about market participant positions on the blockchain are available for real-time market monitoring, detection and later investigation of rule violations. For example, market participants can be automatically prevented from entering excessive orders and large positions that could manipulate or disrupt markets. [10] Such automatic restrictions on a market participant may be dependent upon other open or closed positions recorded in the blockchain. This provides automatic prevention

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[6] In 2012, 38% of members globally and 36% of members in the U.S. see "improved regulation and oversight of global systemic risk" as being the most needed regulatory/industry action. In 2015, that number dropped down to 28% globally and down to just 10% of respondents in the the U.S. *See* Global Market Sentiment Survey 2012, CFA Institute, pg 23. Web. 21 Feb. 2016. Available at https://www.cfainstitute.org/Survey/global_market_sentiment_survey_report.pdf. *See also* Global Market Sentiment Survey 2015, CFA Institute, pg 27. Web. 21 Feb. 2016. Available at https://www.cfainstitute.org/Survey/gmss_2015_report.pdf?WPID=GMSSReportText&PageName=Main.

[7] "Toward a 12-second Block Time" *Blog.Ethereum.org.* Vitalik Buterin, 11 July 2014. Web. 21 Feb. 2016. Available at https://blog.ethereum.org/2014/07/11/toward-a-12-second-block-time/.

[8] "Core Principles and Other Requirements for Swap Execution Facilities" *Federal Register 17 CFR Part 37 RIN Number 3038-AD18.* CFTC, Web. 21 Feb. 2016. Available at http://www.cftc.gov/idc/groups/public/@newsroom/documents/file/federalregister051613b.pdf, pg. 8.

[9] Global Market Sentiment Survey 2015, CFA Institute at pg 27

[10] Shadab, Houman. "Regulating Bitcoin and Block Chain Derivatives" *CFTC.* 9 Oct. 2014. Web. 21 Feb. 2016. Available at http://www.cftc.gov/idc/groups/public/@aboutcftc/documents/file/gmac_100914_bitcoin.pdf, pg 15.

of certain types of trade abuses. Of course, position data from other sources must also be examined in order to conduct an effective market surveillance program. Automatic rule enforcement, auditing, and reporting can be simplified by moving market participants to on-blockchain trades.

Messages that communicate contract terms and contract performance on blockchain are secure and immutable. They cannot be reversed, tampered with, or corrupted. A comprehensive and accurate record of all trading is maintained and this audit-trail data may be made available to and examined by the Commission. Additionally, data on the blockchain is viewable by all nodes and may be queried and analyzed. Blockchains can certainly allow for data standards and harmonization (recognized by the CFTC Technology Advisory Committee as critical)[11]. Advanced blockchain analysis tools and machine learning engines are improving. These tools will provide the ability to compute, retain, and compare trading statistics; compute profit and loss; and provide the sequence of trading activity.

The Commission believes that automated trading alerts, preferably in real time, are the most effective means of detecting market anomalies.[12] However, current market surveillance systems cannot provide complete real-time monitoring of market conditions, price movements, and trading volumes. Instead, due to these constraints, CFTC requirements only require systems detect trading abuses and position limit violations on a T+1 basis. Blockchain databases are well suited for automatic real-time trade surveillance systems. Blockchain technology may enable such real-time monitoring and allow the CFTC to emphasize preventive actions over disciplinary actions for trade abuses.

Blockchains provide market transparency and a real-time structured data audit trail of transactions that are executed on blockchain. Market analysis on the data for trades executed on blockchain is simplified when compared to current systems. Blockchains typically provide synchronized time stamps for trades and specified data structures in transactions to simplify monitoring.

II. Blockchain technology is moving forward internationally

The International Monetary Fund has recommended that regulatory responses adapt to changes in the virtual currency landscape and that regulations be commensurate to the risks without stifling innovation.[13] Other jurisdictions have recognized the value that

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[11]Herrada, Jorge. "CFTC Data Landscape and Update on Joint Efforts on Data Quality." *Office of Data and Technology.* CFTC, 3 June, 2014. Web. 21 Feb. 2016. Available at http://www.cftc.gov/idc/groups/public/@newsroom/documents/file/tac060314_dataoverview.pdf

[12] "Compilation of Existing Testing and Supervision Standards, Recommendations and Regulations." *Office of Data and Technology.* CFTC, 30 Oct. 2012. Web. 21 Feb. 2016. Available at http://www.cftc.gov/idc/groups/public/@newsroom/documents/file/tac103012_reference.pdf.

[13] He, Dong et al. "Virtual Currencies and Beyond: Initial Considerations." *IMF Staff Discussion Note.* International Monetary Fund. January 2016. Web. 21 Feb. 2016. Available at https://www.imf.org/external/pubs/ft/sdn/2016/sdn1603.pdf, pg. 35.

blockchain technology adds to the financial system and have enacted measures to create a favorable regulatory climate. If the U.S. does not follow suit, other jurisdictions may reap considerable benefits. Divergence in blockchain policies across various jurisdictions are likely to create arbitrage. Furthermore, driving blockchain trade activities offshore does not further the Commission's objectives.

A. United Kingdom

In the UK, regulators have made it clear that they approve and welcome blockchain technology and digital currencies. In a report issued by the UK Government's Ministry for Economy and Finance - Her Majesty's Treasury in March 2015, the Government officially recognized that the technology associated with digital currencies "offers considerable promise".[14] The report stated that the government intends to create a world-leading environment for the development of innovative payments and financial technology. The UK government intends to apply digital currency regulation that supports innovation and prevents criminal use.[15] The European Court of Justice has ruled that digital currencies are exempt from value-added tax (VAT).[16]

Harriet Baldwin, Economic Secretary to the Treasury, spoke at the London British Library on October 14, 2015 to the Alan Turing Institute for Data Science.[17] She expressed the positive attitude to FinTech and to digital currencies of the UK and outlined some measures that the UK has implemented to attract innovative blockchain companies. For example, the UK launched the FCA Innovation Hub, which has helped over 100 businesses understand the regulatory framework and apply for FCA authorization. Additionally, the FCA is assessing the feasibility of something called a 'regulatory sandbox', a space that would allow innovators to experiment with new ideas and real customers at an early stage without the burden of excessive regulation. Finally,

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[14] "Digital currencies: response to the call for information." *HM Treasury*, March 2015. Web. 21 Feb. 2016. Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/414040/digital_currencies_response_to_call_for_information_final_changes.pdf

[15] Id.

[16] *See* Fuller, Calum. "Bitcoin to be exempt from VAT, European Court Rules." *Financial Director.* Contented Limited, 27 Oct 2015. Web. 21 Feb. 2016. Available at http://www.financialdirector.co.uk/financial-director/news/2432136/bitcoin-to-be-exempt-from-vat-european-court-rules

[17] Baldwin, Harriet. Speech transcript. *UK.Gov.* 14 Oct. 2015. Web. 21 Feb. 2016. Available at https://www.gov.uk/government/speeches/uk-to-lead-on-big-data-research-says-harriett-baldwin *See also "*Digital Currencies: Response to the Call for Information." *UK.Gov.* March 2015. Web. 21 Feb. 2016. Available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/414040/digital_currencies_response_to_call_for_information_final_changes.pdf.

to complement this work, the government has launched a £10 million research initiative to address the research opportunities and challenges for distributed ledger technology.[18]

B. Singapore

Singapore has enacted measures favorable to blockchain technology and digital currencies. The Monetary Authority has actively funded a blockchain based record keeping system as part of a five-year $225m investment plan aimed at financial technology.[19] The money will be used to build innovation centers and fund financial tech projects such as a blockchain recordkeeping system. The stated goal is to attract financial tech startups to build their companies in Singapore. Ravi Menon, the Managing Director of the Monetary Authority of Singapore, has publicly recognized blockchain technology's ability to provide "faster and more efficient processing, lower cost of operation, and greater resilience against system failure." The Monetary Authority has streamlined compliance processes to reduce compliance costs, automate financial monitoring, invest in education initiatives, and engage more broadly in outreach with financial tech startups.[20]

V. Conclusion

Blockchain technology provides numerous benefits to market efficiency, transparency, and regulatory oversight. Hitfin, Inc. provides blockchain applications, analytics, and consulting. Hitfin appreciates the opportunity to provide this comment to the CFTC Technical Advisory Committee. Hitfin is available to discuss blockchain technology and respond to any questions and concerns. Should the Commission have any questions regarding blockchain technology, please contact the undersigned at nathalie.salami@hitfin.com.

Sincerely,

/s Nathalie Salami

Nathalie Salami, Attorney at Law
CEO, Hitfin Inc.
Nathalie.Salami@hitfin.com

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[18] Id.

[19] *See* Higgins, Stan. "Singapore Central Bank Funds Blockchain Recordkeeping Project." *Coindesk.* 1 July 2015. Web. 21 Feb. 2016. Available at http://www.coindesk.com/singapores-central-bank-backs-blockchain-project-with-225m-fintech-plan/

[20] Id.